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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,680	03/05/2002	Jiang Hsieh	120335	7220

7590

04/06/2005

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EXAMINER
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SULLIVAN, JULIANNE M

ART UNIT	PAPER NUMBER
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3737

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/091,680

Applicant(s)

HSIEH, JIANG

Examiner

Julianne M. Sullivan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/22/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 26 is objected to because of the following informalities: there is no antecedent basis for the following limitation: in lines 2-3, "the error image." Appropriate correction is required.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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3. Claims 3, 6, 15, 18, 24 and 26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over Claims 1 and 3 of U.S. Patent No. 6,115,487 to Toth et al. in view of Snyder et al. (U.S. Patent No. 5,923,775).

Although the conflicting claims are not identical, they are not patentably distinct from each other because Toth et al. teaches the features of the present invention, including a correction method where the error image is scaled corresponding to the angle and subtracting the error image to produce an improved image, except for expressly teaching the use of an estimated gradient to generate the gradient image and the production of an error projection from the gradient image. In the same field of endeavor, Snyder et al. teaches the use of a gradient image from an estimated gradient, used to produce an error projection (col. 1, lines 65-67, col. 2, lines 8-9 and col. 3, lines 29-35 and 55-62). It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the scaling and subtraction methods of Toth et al. to the gradient images and error projections of Snyder et al. in order to produce an image with reduced artifacts.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 5, 7, 10-14, 17 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattson et al. (U.S. Patent No. 5,229,934) in view of Snyder et al. (U.S. Patent No. 5,923,775).

Mattson et al. teaches a method and computer, which is used in a CT system having a radiation source and detector array, for reconstructing an image that includes producing an error projection using a gradient image, where the error projection is produced by forward projecting the gradient along a projection view angle, where the error projection is used to construct an error image and where a final image is generated by subtracting the error image from the original image (col. 3, lines 11-14 and 18-24, col. 4, lines 49-64, col. 5, lines 8-10 and col. 6, lines 13-17 and 34-38). Mattson et al. does not teach using an estimated gradient to generate the gradient image, where the gradient is produced by comparing three or more images with some threshold value, or using a segmentation technique to produce different gradient images, where the technique involves using different threshold values for different classes of objects.

In the same field of endeavor, Snyder et al. teaches a gradient estimation system that is used to estimate a gradient by comparing three or more images to a threshold value to produce a gradient image, which can then be used in image reconstruction (col. 1, lines 65-67, col. 2, lines 8-9 and 14-20 and col. 3, lines 29-35). Snyder et al. further teaches the use of a segmentation technique to produce different gradient images where the segmentation technique provides a plurality of threshold values (col. 3, lines 40-44 and col. 5, lines 25-52). It would have been obvious to one of ordinary skill in the art at the time of the invention to have used the techniques of Snyder et al. to produce the gradient images used in Mattson et al. to estimate and reduce the noise or artifacts in images (see for motivation Snyder et al. at col. 1, lines 60-61).

6. Claims 3, 6, 8, 15, 18, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattson et al. in view of Snyder et al. as applied to Claims 1, 13 and 22 above, and further in view of Toth et al. (U.S. Patent No. 6,115,487).

Mattson et al. in view of Snyder et al. teach all of the features of the present invention except for expressly stating that the error candidate image is scaled based upon the view angle or that it is helically weighted. In the same field of endeavor, Toth et al. provides a correction method where the error image is scaled corresponding to the angle and a method using helically weighted error data (col. 2, lines 13-21, 42-46 and 54-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to have scaled or weighted the error image of Mattson et al. with the method of Toth et al. in order to improve the error correction process.

7. Claims 4, 16 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattson et al. in view of Snyder et al., and further in view of Toth et al. as applied to Claims 3, 15 and 24 above, and further in view of Florent et al. (U.S. Patent No. 5,594,845).

Mattson et al. in view of Snyder et al. and Toth et al. teach all of the features of the present invention except for expressly stating that the scaling of the error projection was based upon the projection view angle, center view angle, pitch and size of the detector array. In the same field of the endeavor, Florent et al. teaches an image processing method where scaling is based upon the panning angle, the center angle, the tilting angle and the size (col. 2, lines 42-62). Here, the Examiner has interpreted the dependence of the scaling on the number of pixels in the target array as equivalent to Applicant's use of detector array size. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the scaling scheme from Florent et al. in the scaling method of Toth et al. in order to reduce the complexity of the image processing method (see for motivation Florent et al. at col. 2, lines 32-38).

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8. Claims 9 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mattson et al. in view of Snyder et al. as applied to Claims 1 and 13 above, and further in view of Moore (U.S. Patent No. 4,222,104).

Mattson et al. in view of Snyder et al. teach all of the features of the present invention except for explicitly stating that the forward projection of the gradient is either a fan beam or parallel beam forward projection. In the same field of endeavor, Moore teaches that parallel beam forward projections are very well known in image processing techniques (col. 7, lines 12-19). It would have been obvious to one of ordinary skill in the art at the time of the invention to have generated the error image from the gradient image through the use of a parallel beam forward projection in order to provide a simple procedure for the generation of the image (see for motivation Moore at col. 4, lines 8-19).

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julianne M. Sullivan whose telephone number is 571-272-6084. The examiner can normally be reached on Monday through Friday 8:00am to 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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